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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/389,904	09/03/1999	PHILIP D. WRATCHFORD	P-5531	6016

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EXAMINER

DO, AN H

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 10/15/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/389,904

Applicant(s)

WRATCHFORD, PHILIP D.

Examiner

An H. Do

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-28 and 39 is/are allowed.
- 6) ☒ Claim(s) 1-3, 29 and 31-37 is/are rejected.
- 7) ☒ Claim(s) 4-15, 30 and 38 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This is the third Office Action on the merits responsive to the filing of the pending application.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goepel et al (US 5,182,578) in view of Mitani et al (US 5,666,140).

Goepel et al discloses in Figures 1-3 an apparatus and method of an ink jet print head (1) comprising a plurality of ink channels (3) disposed in a common plane, each of the channels (3) having at least one orifice (2) for projecting ink towards a substrate; and an ink heater (6, 7) made of a positive temperature coefficient thermistor material (column 3, lines 40-42), and having a substantially planar configuration (Figure 1).

Goepel et al discloses the claimed invention except for reciting the ink heater extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels.

Mitani et al teaches in Figure 2 the ink heater (16) extending in a plane generally parallel to the plane of the ink channels (11) and adjacent to the ink channels (11).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to configure the ink heater parallel to the plane of the ink channels

and adjacent to the ink channels, as taught by Mitani et al, for the purpose of generating a pulse of heat to form an expansion of vapor bubble as noted in column 1, lines 20-28 of Mitani et al.

3. Claims 29 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goepel et al (US 5,182,578) in view of Junichi (JP 407025011A).

Goepel et al discloses in Figures 1-3 an ink jet print head (1) comprising a plurality of ink channels (3) disposed in a common plane, each of the channels (3) having at least one orifice (2) for projecting ink towards a substrate; and an ink heater (6, 7) made of a positive temperature coefficient thermistor material (column 3, lines 40-42), and having a substantially planar configuration (Figure 1).

Goepel et al discloses the claimed invention except for reciting first and second electrodes extending on one side of the planar member.

Junichi teaches in Figure 1 the use of PTC electrodes (9) on surfaces of the sidewalls (Abstract).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the electrodes on the planar member, as taught by Junichi, for the purpose of alternating the use as a conductor or insulator depending on the temperature levels as noted in the last three lines of the Abstract of Junichi

***Allowable Subject Matter***

4. Claims 16-28 and 39 are allowed.

5. The following is an examiner's statement of reasons for allowance:

Regarding claim 16, the ink heater having a substantially planar configuration and is located between the lower side of the intermediate body portion and the main body portion, and extends in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Claims 4-15, 30 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 4 and 5, wherein the thermistor material includes a first side and a second side, and the ink heater includes a first electrode and a second electrode located on the first side of the thermistor material, wherein heat is generated on the first side of the thermistor material between the first and second electrodes, and a first lead electrically coupled to the first electrode, and a second lead electrically coupled to the second electrode.

Regarding claims 6 and 30, wherein the ink heater include a first edge and a second edge, the first edge is located opposite from the second edge, the first and second edge extend in a direction which is substantially perpendicular to the plurality of

ink channels, the first electrode extends along the first edge and the second electrode extends along the second edge, whereby the first and second electrodes are opposite from one another and substantially parallel.

Regarding claim 7, wherein the first electrode extends near a center portion of the thermistor material, and the second electrode extends near the center portion of the thermistor material, whereby the first and second electrodes are in close proximity to one another so as to minimize the time the ink heater reaches equilibrium.

Regarding claim 8, wherein the plurality of ink channels include one or more channels which dissipate heat at a higher rate than other channels, and the first and second electrodes are located in an arrangement so that the thermistor material generates greater heat in a first area located adjacent the one or more channels than a second area adjacent the other channels.

Regarding claim 9, wherein the plurality of ink channels include outside channels and inside channels, and the first and second electrodes include a first end and a second end and a mid-portion, wherein the first and second ends are wider than the mid-portion, whereby greater heat is generated adjacent the outside channels than adjacent the inside channels.

Regarding claim 10, wherein the plurality of ink channels include outside channels and inside channels, the first and second electrodes include a first end and a second end and a mid-portion, wherein the first and second ends are narrower than the mid portion, whereby greater heat is generated adjacent the inside channels than adjacent the outside channels.

Regarding claim 11, wherein the ink heater includes a first longitudinal edge, a second longitudinal edge, a first transverse edge and a second transverse edge, the first longitudinal edge is located opposite from the second longitudinal edge, the first and second longitudinal edges extend in a direction which is substantially perpendicular to the plurality of ink channels, the first transverse edge is located opposite from the second transverse edge, the first and second transverse edges extend in a direction which is substantially parallel to the plurality of ink channels, the first electrode is substantially U-shaped and extends along the first and second longitudinal edges and the first transverse edge, and the second electrode extends in an area defined by the U-shaped first electrode and in a direction parallel to the first and second longitudinal edges.

Regarding claim 12, further comprising: a top body portion having a first plurality of ink channel grooves extending in a longitudinal direction; an intermediate body portion having an upper side and a lower side, a second plurality of ink channel grooves extending in a longitudinal direction along the upper side, the upper side of the intermediate body portion located adjacent the top body portion wherein the first and second plurality of ink channel grooves form the plurality of ink channels; a main body portion located adjacent the lower side of the intermediate body portion; and wherein the ink heater is located between the lower side of the intermediate body portion and the main body portion.

Regarding claims 13-15 and 38, wherein the main body portion includes a recess and first and second grooves extending in a longitudinal direction from the recess,

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wherein the recess receives the thermistor material and the first and second grooves receive the first and second leads, respectively, wherein the thermistor material is secured to the immediate body portion with thermally conductive adhesive, and an insulating air gap is formed in the recess between the thermistor material and the main body portion, a print head controller electrically coupled to the ink heater, wherein a voltage potential is applied across the first and second leads.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 29, 33 and 36 have been considered but are moot in view of the new ground(s) of rejection. Applicant argued that the heater (120) in Junichi having a substantially planar configuration that is generally parallel to the plane of the ink channels. However, the newly found references of Goepel et al and Mitani et al, in combination, disclose this feature. In Figures 1-3 of Goepel, it is disclosed that the ink heater (6, 7) made of a positive temperature coefficient thermistor material (column 3, lines 40-42), and having a substantially planar configuration (Figure 1). However, Goepel failed to disclose the ink heater extending in a plane generally parallel to the plane of the ink channels and adjacent to the ink channels. Mitani et al teaches this deficiency in Figure 2 by showing the ink heater (16) extending in a plane generally parallel to the plane of the ink channels (11) and adjacent to the ink channels (11).



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**Contact Information**


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 703-308-0525. The examiner can normally be reached from Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow, Jr. can be reached on 703-308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3431 for regular communications and 703-305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



AD  
October 8, 2002



John Barlow  
Supervisory Patent Examiner  
Technology Center 2800